



## SUMMARY OF STATEMAP GEOLOGIC MAPPING PROGRAM IN VIRGINIA

Federal Fiscal Year	State Dollars	Federal Dollars	Total Project Dollars
1996	\$ 20,702	\$ 20,702	\$ 41,404
1997	49,345	49,345	98,690
1998	50,000	50,000	100,000
1999	45,728	45,728	91,456
2000	48,258	48,258	96,516
2001	22,899	22,899	45,798
2002	31,628	31,628	63,256
2003	95,955	95,955	191,910
<b>TOTALS</b>	<b>\$364,515</b>	<b>\$364,515</b>	<b>\$729,030</b>

### Virginia Geology

Virginia is characterized by perhaps the most varied terranes and complex geology of any state in the United States. Five physiographic provinces in Virginia are, from east to west: the Atlantic Coastal Plain, the Piedmont, the Blue Ridge, the Valley and Ridge, and the Appalachian Plateaus.

**The Coastal Plain Province.** The Coastal Plain is comprised of mostly unconsolidated sediments that extend inland for more than 100 miles. Economic materials mined in the province are sand, gravel, and clay. Recently, mining for heavy mineral sands (ilmenite, leucoxene, and zircon) began.

**The Piedmont Province.** The Piedmont extends from the Fall Line westward to the Blue Ridge Mountains. Structurally, it is composed of a complex of metamorphic and igneous rocks. The metamorphic rocks are schists, gneisses, basalts, slates, phyllites, marbles, and quartzites. These rocks have been further altered by intrusions of granite, gabbro, diabase, pegmatite, and other igneous rocks. Rocks and minerals mined from the Piedmont are kyanite, slate, vermiculite, granite, gabbro, diabase, and feldspar. Sand and gravel are mined along river drainages. Some gem "mining" occurs in pegmatite. Former mined commodities includes gold, lead, zinc, copper, soapstone, manganese, iron, and pyrite.

**The Blue Ridge Province.** The rocks that form the Blue Ridge Province include a basement complex of Precambrian granite and granulites along with late Precambrian metamorphosed sedimentary rocks. Quartzite and gneiss rocks in the Blue Ridge are quarried for aggregate, and past mining has occurred for copper, iron, manganese, and a limited amount of tin.

**The Valley and Ridge Province.** This is the most varied region of the State, both topographically and geologically. Strata composed of shale, dolostone, and limestone dominate on the east, and grade westward into strata composed generally of sandstone, siltstone, and shale. Karst features, such as sinkholes and sinking creeks, are common throughout the province. Resources currently utilized from this province are limestone, dolostone, sandstone, iron-oxide pigments, clay, oil, natural gas, and shale. Past resources included salt, manganese, iron, lead, zinc, barite, gypsum, and coal.

**The Appalachian Plateaus Province.** The Appalachian Plateaus fringe the Valley and Ridge on the west in the southwestern part of the State. The sedimentary units are coal, shales, siltstones, and sandstones. The Southwest Virginia coalfield is totally contained within this province. In addition to coal, this province contains valuable resources of coalbed methane, natural gas, some oil, and crushed stone.

### Virginia Mineral Resources

The most important current mineral resources of Virginia are coal, aggregate, sand and gravel, lime (limestone and dolostone), and natural gas. The only deposit of kyanite being mined in the United States is in Buckingham County. Virginia is the only producer of a feldspar marketed as "Virginia Aplite" and is the second leading producer of vermiculite.

A wide variety of non-metallic industrial minerals are of great importance to Virginia. These include aggregate and dimension stone, sand and gravel, limestone for cement and lime production, kyanite, soapstone, feldspar, iron-oxide pigments, vermiculite, gemstones, and clay materials.

The non-fuel minerals industry is an important aspect of Virginia's economy. In 2000, there were 495 industrial-mineral mining operations permitted throughout the Commonwealth. In

2000, at least 88 million tons of non-fuel minerals, with a value of 692 million dollars, were produced.

The importance of the fuel minerals industry to Virginia's economy is best exemplified by the coal industry. During 2000, 117 active surface coal mines and 226 underground coal mines reported production. Approximately 33.3 million tons of coal was mined in 2000 with a value of 1.13 billion dollars.

More than 12 billion dollars of mineral commodities can be attributed to the Commonwealth for 2000. This includes the indirect impacts that occur in the "expenditures" of salaries and wages in local communities; in equipment, services, and goods purchased from suppliers; in the rail transportation industry; and in our export facilities.